CASE REPORT

Strangulated gastric prolapse through a gastrostomy site requiring emergent partial gastrectomy

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SUMMARY

Strangulated gastric prolapse through a percutaneous endoscopic gastrostomy tract is a rare and potentially life-threatening complication that requires surgical intervention. We describe a case of a 74-year-old woman who was debilitated and ventilator-dependent and who presented with acute gastric prolapse with resultant ischaemic necrosis. The patient underwent an emergent exploratory laparotomy, partial gastrectomy, repair of gastrostomy defect and placement of a gastrojejunostomy feeding tube remote to the previous location. Literature on gastric prolapse in adult patients is sparse, and therefore treatment is not standardised. In this patient with strangulated tissue, the principles of management included the assessment of gastric mucosa viability, resection of ischaemic tissue and closure of the gastrostomy defect.

BACKGROUND

Percutaneous endoscopic gastrostomy (PEG) is a reliable method for providing long-term enteral nutritional support to patients with a functioning gastrointestinal tract.¹⁻³ Although gastrostomy tubes provide immunological advantages over parenteral nutrition and are more robust than naso-enteric tubes, they are often burdened by complications requiring intervention.²⁻⁶ Tube dislodgement, peristomal leakage and wound infections are the most common indications for gastrostomy replacement or revision.⁴⁻⁶ In contrast, gastric prolapse is a rare and potentially life-threatening complication when the stomach extrudes through the gastrostomy tract outside the abdomen.⁷⁻⁹ We present a unique case of a debilitated, malnourished patient who presented with a strangulated gastric prolapse requiring emergent partial gastrectomy.

CASE PRESENTATION

A 74-year-old woman with Alzheimer's disease and chronic respiratory failure and is ventilator-dependent presented from a long-term acute care facility with a large, maroon-coloured mass enveloping her gastrostomy tube. Reportedly, the mass developed acutely over a 12-hour period (figure 1). Her feeding gastrostomy tube had been placed percutaneously under endoscopic guidance several years prior, but had been accidentally dislodged on several occasions since initial placement, including the week prior to her presentation. At that time, a CT scan of the abdomen and pelvis demonstrated

no significant acute pathology (figure 2). At this presentation, the exposed tissue was found to be congested, ischaemic gastric mucosa. The mass was not reducible and there was concern for gastric necrosis. Her abdominal examination was also significant for truncal obesity (body mass index of 28) and a large periumbilical, non-incarcerated incisional hernia containing small bowel.

INVESTIGATIONS

CT scanning of the abdomen can confirm the identity of the evaginated structure, but typically tissue which has everted or prolapsed through a gastrostomy site will be the stomach. This condition requires urgent surgical consultation and correction, and further delay in surgical evaluation by superfluous imaging serves only to exacerbate ischaemia and necrosis of the gastric wall.

DIFFERENTIAL DIAGNOSIS

1. Gastric prolapse
2. Concomitant evagination of small bowel or colon within the gastric prolapse (this would be easily identified at laparotomy)

TREATMENT AND OUTCOME

Emergent exploration through a midline laparotomy revealed engorged, ischaemic herniated gastric tissue, and a healthy, viable intra-abdominal stomach. A relaxing incision at the gastrostomy site relieved the strangulation, but despite reperfusion and tissue warming a 15-cm portion of the anterior body remained non-viable (figure 3). A partial gastrectomy was performed to excise the necrotic tissue, and the stomach was returned to the abdomen. The defect was closed in two layers with running Connell (absorbable braided suture) technique and imbricating Lembert's (2-0 silk suture) technique. Prior to completing the gastrectomy closure, a feeding gastrojejunostomy tube was placed, exiting through a new site in the abdominal wall.

The previous gastrostomy fascial defect was closed primarily and the subcutaneous tissue was left open to heal by secondary intention. The laparotomy incision was closed with interrupted non-absorbable, braided suture, and the skin was approximated with non-absorbable, monofilament suture (figure 3). The patient tolerated the initial procedure well, but her postoperative course was complicated by abdominal compartment syndrome

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Figure 1 Anterior-superior view of gastric prolapse with ischaemic mucosa. The protrusion below skin to the right is a reducible, incisional hernia.

requiring opening of her midline laparotomy incision. Serial abdominal wound vacuum changes revealed an intact gastrectomy closure (figure 4). Delayed fascia and skin closure was performed. After a protracted intensive care unit stay, the patient was discharged to her outside nursing facility with a healing abdominal wound and a functioning gastrojejunostomy tube.

DISCUSSION

PEG tube placement was first described by Gauderer *et al*,¹ and carries a low procedure-related morbidity and mortality.^{5 10} Although placement is safe and reliable, minor postoperative complications are common, including wound infection, superficial bleeding, leakage of gastric contents, and tube blockage and dislodgement.⁴⁻⁶ Major complications described in the literature, including gastric outlet obstruction, gastrocutaneous fistula, buried bumper syndrome, visceral perforation and necrotising fasciitis, occur far less frequently.⁴⁻⁶ Gastric prolapse, a recognised entity in paediatric patients, is rarely reported in adult populations.⁷⁻⁹ Therefore, the aetiology, incidence and best clinical management remain unknown. This case reveals the potential for strangulation of a gastric prolapse and the need for prompt surgical intervention.

Gastric prolapse is a full-thickness protrusion, or evagination, of the stomach through the abdominal wall, resulting in

Figure 2 CT scan of the abdomen and pelvis obtained (1 week prior to presentation) after the patient's gastrostomy tube was dislodged (star indicates stomach). The imaging shows widening of the fascia at the gastrostomy orifice with no significant prolapse. (Left) Axial view. (Right) Sagittal view showing the large incisional hernia near the gastrostomy site.

Figure 3 Exploratory laparotomy. (Upper left) Attempted reduction of the gastric prolapse was unsuccessful. (Upper right) Despite a relaxing incision at gastrostomy site, the gastric mucosa remained non-viable requiring a partial gastrectomy. (Lower left) The intra-abdominal stomach was viable, including the pylorus (indicated by index finger). (Lower right) The midline laparotomy was closed and a new gastrostomy tube was placed.

exposed gastric mucosa. Proposed mechanisms that widen the gastrostomy orifice, thus increasing the risk of prolapse, include (1) dilation through upsizing of catheter diameters, (2) frequent dislodgement and (3) excessive leakage and excoriation enlarging the stoma opening.⁷ Moreover, sources of increased pressure on the abdominal wall (eg, frequent coughing, mechanical ventilation, constipation, obesity) and surgical technique (eg, large stoma creation) may result in an unacceptably wide stoma orifice, allowing egress of the stomach. Lastly, patients with thin abdominal walls and poor muscle bulk may be more susceptible to prolapse. The patient in this case had multiple risk factors for developing a wide gastrostomy orifice, including chronic

Figure 4 At abdominal wound vacuum change, the gastrectomy closure was intact.

respiratory failure (ie, ventilator-dependence), poor nutrition, a thin abdominal wall and frequent tube dislodgement.

Gastric prolapse is well documented in paediatric populations, most recently by Janik *et al.*,⁷ who performed a retrospective review of gastrostomy tubes and identified gastric prolapse in 1.2% (13/1042) of patients (average age at diagnosis was 28 months). The authors observed that prolapse was associated with neurological disorders, poor nutrition, ventilator dependency and laparoscopically placed gastrostomy tubes.⁷ The authors advised revision for gastric prolapse when the gastrostomy tube fails to remain seated or the stomach does not retain enteral feeds.⁷ Furthermore, if a patient presents with gastric ischaemia, emergent operative intervention is indicated.

The initial management of patient presenting with gastric prolapse is directed at assessing the tissue viability of the exposed organ. If viable, manual reduction may be attempted prior to definitive management. Recurrence is probable, and therefore closure of the gastrostomy is recommended. If reduction is unsuccessful, emergent intervention is needed to alleviate the incarceration. This can be facilitated by a relaxing incision at the gastrostomy site to allow the stomach to retract into the intra-abdominal space. This was described by Campbell *et al.*,⁹ who enlarged the gastrostomy site and closed the gastric defect (without gastrectomy) in a debilitated 74-year-old woman with gastric prolapse.

Our patient had non-viable gastric mucosa, and therefore we elected to perform a laparotomy to adequately evaluate the remaining stomach. After relieving the strangulation with

a relaxing incision, margins of non-viable tissue were determined. A partial gastrectomy was completed without resecting portions of the fundus proximally or the pylorus distally. Anatomic pathology confirmed the clinical diagnosis of necrosis of the excised portion of the stomach. Given our uncertainty of the extent of gastric ischaemia at the time of operation, a laparotomy proved to be the safest approach, as this permitted a thorough abdominal exploration and adequate exposure for more extensive resection. Regardless of the operative approach, the principles of a timely assessment of tissue viability, prompt intervention, resection of ischaemic viscera and closure of the gastrostomy site remain the tenets of gastric prolapse management.

Contributors SPJ is the main author and primary investigator of this case report. BR is the second author and he contributed through background research, writing and organisation of the case report. M-MB is the third author and she provided oversight on the content, structure and editing of the manuscript. HLA is the corresponding author and he provided oversight on the content and editing of the manuscript.

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Learning points

- Gastric prolapse through a percutaneous gastrostomy site is a rare condition in adults.
- Although the aetiology of gastric prolapse is unknown, risk factors proposed include frequent gastrostomy tube dislodgement, excessive leakage, upsizing catheter diameter, ventilator dependency, increased intra-abdominal pressure, neurological disorders and malnutrition.
- Strangulation of gastric prolapse requires emergent intervention.
- The tenets of gastric prolapse management include the assessment of gastric mucosa viability, prompt resection of non-viable tissue and closure of the gastrostomy defect.

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